



Strategic Plan

2000-2005



Improving Water and Land Resources Management for Food, Livelihoods and Nature

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The Strategic Plan for IWMI 2000–2005

Key choices, changes and the new research directions

In preparing this Strategic Plan, the guide for our research for the coming five years, a range of key choices and changes was discussed among IWMI's Board, staff and with stakeholders from the donors, National Agricultural Research and Extension Services and international research communities.

Some changes and ways of strengthening the work of the Institute are being made as a result of these consultations. But in the most important aspect of IWMI's work—the overall topic and approach to our core research business—the Strategy does not call for change. The research direction that has been successfully implemented during the past five years is on the mark. This is IWMI's move towards strategic natural resources management research at the river basin scale.

During this time, IWMI's work has evolved from a focus on irrigation management, to a focus on the analysis of water resources demand and supply for food production in a river basin context. A further step forward has now been made. We will direct our research on the integrated analysis of water and land uses, particularly in agriculture, *in a natural resources management framework*.

The substantive changes made through this Strategic Plan are to broaden IWMI's scope from exclusively water resources to water and land resources management, to open a new research theme on *groundwater management* and to develop the environmental component of our *health and environment*-related program. These changes confirm the directions and tendencies already nascent in IWMI's work. IWMI has incorporated the sustainable land use management program of the former International Board for Soil Research and Management (IBSRAM) into its research themes.

In terms of regional emphasis, the trend of expansion in Africa and Asia that has been progressing over the past several years is confirmed. A Regional Office in Pretoria, South Africa has been established and will coordinate research activities in southern and sub-Saharan Africa. The IBSRAM office in Bangkok becomes IWMI's Southeast Asia Regional Office. A Regional Office was opened in India in January 2001. Further expansion is expected in China, which may lead to the establishment of an office there during the period of this Strategic Plan.

The key changes proposed are in two areas that will help strengthen the research capacity and overall effectiveness of the Institute: *organization of the research* and *management of the organization*.

Research themes are the key instrument chosen to address the need for strategic priority setting in the Institute and to assure thematic integration of research agendas across physical locations (offices). *Regional offices* from which the work in a region is coordinated and done are our choice to get closer to the field, spend more time in the field and travel less.

Working through themes and regional offices will make the Institute's resources more equitably accessible across IWMI's research program. *Benchmark Basins* are field laboratories where we will do long-term work. This will enable us to better assess impacts, develop long-term partnerships with NARES¹, including universities, and make comprehensive datasets publicly available in an organized manner.

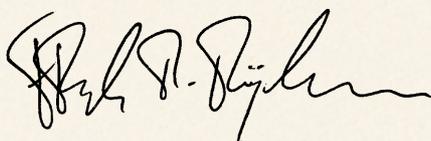
IWMI will also make a more organized effort to develop long-term partnerships with Advanced Agricultural Research Institutes, NGOs and NARES, both as part of its research and as part of its reinforced capacity-building program.

Other key changes are progressing in human resources management, and planning and research management. IWMI has put in place a PostDoc and PhD program to attract many more young scientists from the South. This effort will have capacity-building impacts and change the balance in the research staff (North-South and senior-junior).

The employment conditions of internationally and nationally recruited scientists are being revised towards a single system for all staff. For nationally recruited support staff this effort concentrates on aspects such as improved training, career development and job classification options, annual evaluations and job rotation.

Other changes are being put into action through four high-priority organizational change projects, each with a clear timeline and budget. These are: a *Timewriting project* to create a function planning, budgeting, timewriting and project monitoring system; an *Intranet project* to develop a pilot Intranet that operates across offices, provides information, and becomes the platform for Institute procedures; a *Database project* to streamline the research and Institute databases, and make datasets available to all interested users. The *Quality project* will put in place a Quality Management system with ISO certification at IWMI.

During the last five years, David Seckler set up IWMI's shop on the global waterfront. He had a vision that was borne out by the oncoming wave of attention for water issues worldwide. We intend to ride that wave. Surfing requires skill, a good sense of timing and a willingness to "go for it." There are no second chances for those who miss the wave. Let us be prepared, carefully pick our wave, and try to have a ride that lands us—with a big impact—right on the beach!



FRANK RIJSBERMAN
Director General
January 2001

¹National Agricultural Research and Extension Services (NARES), including universities.

Strengths and weaknesses of IWMI in 2000

Strengths

- A well-motivated staff and a stimulating work environment.
- Relative strength in multidisciplinary research (but can be improved).
- Its position as an international institute gives global access.
- From recent work IWMI has gained a reputation in a niche of the water research world (irrigation management transfer, river basin efficiency, global water scarcity, health aspects of water management).
- World-class publications that are widely, easily and freely accessible, also through the Institute's website.
- Its recognized role as a worldwide platform for the exchange and dissemination of information.

Weaknesses

- Past work has been insufficiently capitalized on to form an asset for future work (e.g., in the form of structured data and experience; or in benchmark river basins).
- Internal communication could be improved; will lead toward better planning.
- The absence of timewriting separates financial planning from project planning and personal planning.
- Too few junior scientists in relation to seniors. Seniors are overcommitted.
- Too few scientists from the South or women in senior positions.
- Funding in recent years has been flat to declining.
- Priority setting can be improved.
- National programs are not integrated with Colombo-based "global" programs, giving limited flexibility afforded to national programs.

Opportunities

- The increasing interest in water resources worldwide—with water security, hydro-solidarity, land-water linkages and transnational basins as emerging themes.
- Strengthening partnerships in the South with advanced research institutes as well as non-traditional partners—outside agriculture and irrigation.
- IWMI can develop an advocacy role in international development and political fora.
- Capitalizing on past work and improved reputation to expand domains of expertise and research.
- Strengthened cooperation with CGIAR National Resources Management partners.

Threats

- Decreasing support for CGIAR and agricultural research in general.
- Inability to translate research outputs into policy options and user-friendly applications for national systems.

From research to impact— IWMI's road map to 2005

The IWMI Strategy 2000–2005 is our road map for identifying the problems that need to be solved related to water, poverty and rural development, for choosing the areas where we are confident we can make a contribution—an impact that grows out of research findings—and how we will organize ourselves to deliver on this commitment.

The first part of this document explains the organizational approach and the structure that have been put in place at IWMI beginning January 2001 to drive the research program. An important part of this is a series of change projects that will be done over several years. They will transform the Institute into a modern, global research organization that is strong, lean and has the flexibility to evolve with the times.

The core of the document details the five research themes where all the Institute's energy will be concentrated over the coming five years. It presents the activities of each theme and project outputs, and targets—often expressed in terms of people "touched" or opinions changed by the results of the research.

The final part shows the shape of the Institute, in figures, nationalities and other data, and charts how we expect it to evolve over the coming five years.

FINE-TUNING THE SKILL BASE

Part of this process was a consultation on drafts of the strategy with some 70 key stakeholders worldwide (from the donors, research and national partners communities). From these discussions grew a series of facts and conclusions about how the Institute can best move forward. Some examples are:

- **The Institute has expertise in certain areas that can be capitalized on.** *Two new research themes were formed to bring out specific areas of excellence that were 'hidden' in general research activities. The Institute decided to create specific research themes for smallholder water and land innovations and sustainable groundwater questions.*
- **More research 'firepower' is needed to tackle a broader research agenda.** *A post doctoral program was started, and a first group of young professionals joined the Institute in January 2001. Through this program IWMI will increase its research ranks by up to 50 researchers over five years. This will also dramatically increase the number of young scientists from the South at the Institute.*
- **Research goals are quantifiable and impact-oriented. The Institute has a wealth of research that will be more aggressively disseminated and put into the hands of users.** *The new work plans that guide each of IWMI's five research themes are as specific as possible about the type of outputs (in terms of types of tools and practical materials to be delivered) and impact (in terms of people affected). A series of strategic partnerships have been signed with national agencies, international NGOs with broad local links and research institutes with complementary expertise. The goal of these partnerships is to bring research results to users.*

Who is IWMI? What are we best at? Where are our skills most needed?

IWMI holds a special place in the world of water and in the international agricultural research community. The Institute has strong expertise in multidisciplinary research on water resources management.

Through the knowledge gained since 1995 in research into water management in the river basin context, IWMI has a better grasp than most organizations of how to put the concept of Integrated Water Resources Management into practice. IWMI is probably the only international research organization that uses this integrated approach to researching water, poverty and rural development questions.

The international character of IWMI's staff, its research mandate and the location of its research sites, give IWMI researchers a broader perspective than those working on national-level problems. This perspective is the most important added-value that IWMI brings to the research community and to developing countries. A goal for the Institute over the coming five years is to identify innovations and positive trends in water management—at the community, technical and policy levels—and to facilitate the transfer of these ideas to help other regions improve their situations.

Opportunities have been identified to transfer ideas between Africa and Asia, and vice versa. A good example of the catalyzing role the Institute can play is its current work in India. Here, a five-year project aims to create a coalition of national research institutes working on water resources questions. IWMI will help translate the results of these partners' research into useful ideas and guidelines, to encourage policy makers take action to address the country's groundwater problem.

From recent research outputs IWMI has gained a reputation in a niche of the water research world (irrigation management transfer, river basin efficiency, global water scarcity, health aspects of water management). A number of IWMI tools and concepts based on this work are being used in several countries. They are also being disseminated as broadly as possible in developing countries.

The concepts published in the IWMI Research Report series are increasingly recognized as world-class science. They are freely available and accessed daily by people worldwide through the Institute's website. These products—coupled with researchers' participation in conferences, international working groups and on national research committees—have helped establish IWMI as a worldwide platform for the exchange and dissemination of information on water resources for rural development.

A Vision of IWMI in 2005

Targets and Guiding principles

In 2005 IWMI will be recognized by its peers as one of the top three Institutes in the world in three or four of its research themes.

IWMI is first and foremost a research institute specializing in integrated water and land resources management. Its core business is producing new knowledge and making sure this new knowledge reaches the intended users (directly or indirectly) and that the new knowledge created contributes to achieving the Institute's mission (i.e., has an impact).

The quality of IWMI's research is measured:

- By publication in high-quality international journals and in IWMI's peer-reviewed scientific publications.
- By the recognition IWMI researchers receive from colleagues in the international scientific community.
- Through the Institute's standing in the international research community.
- Through the adoption of its knowledge by policy makers, water managers and users.

The Institute ensures that its research knowledge reaches the intended users in developing countries. To achieve this, IWMI works with partners (governments, research partners and NGOs) to ensure that IWMI knowledge reaches poor people and has an impact.

Impact: Each Research Theme sets quantitative targets. These targets are related as closely as possible to its mission. Every project proposal outlines new knowledge that will be produced through the research described, how this contributes to the mission and how it will reach the target groups.

Size and professional weight: IWMI's research will be led by internationally recognized researchers. Each senior researcher will be supported by 3-4 junior researchers and research assistants. This requires that IWMI grow to an Institute of some 100 scientists, from its current level of roughly 50.

Funding: The total budget is targeted to grow by 50 percent. To achieve the research targets set out in this Strategy, the overall required budget is expected to grow by 50% by 2005. IWMI will also tap nonagricultural research funding sources interested in addressing global water and environmental issues.

IWMI LOGICAL FRAMEWORK

GOAL: Contributes to the CGIAR mission of poverty eradication, food security and environmental conservation in developing countries.
INTERMEDIATE GOAL (IWMI's Mission): Improved management of water and land resources for food, livelihoods and nature.
Indicator 1: Policy and institutional reforms seen in the water sector in developing countries.
Indicator 2: Adoption of research tools, methodologies and findings by partners.
Indicator 3: Research and institutional capacity of partners strengthened.
Purpose 1: Reinvent irrigation for the twenty-first century.
Indicator 1: Benefits and costs of past irrigation development well understood.
Indicator 2: Global dialogue and consensus by stakeholders on sustainable options.
Purpose 2: Support partners through research, data management and improved tools.
Indicator 1: Improving long-term trends in water management in reference basins.
Indicator 2: Sustainable approaches adopted for integrated management of water and land resources.
Purpose 3: Enhance NARES' research and institutional capacities.
Indicator 1: Partnerships developed with donors and partners for an effective HRD program.
Indicator 2: Capacity-building is institutionalized through collaborative activities.

INDICATORS	<p>OUTPUT 1. Integrated Water Resources Management for Agriculture Promoted</p> <p>1.1 Tools, processes and knowledge developed and disseminated to water resource managers to adapt and respond to new and changing needs and expectations.</p> <p>1.2 Sustainable options identified, evaluated and disseminated for increasing water productivity and poverty reduction.</p> <p>1.3 Partner capacities strengthened for research, actions and processes to achieve sustainable improvements in water productivity in agriculture.</p>
INDICATORS	<p>OUTPUT 2. Sustainable Smallholder Water and Land Management Systems Promoted</p> <p>2.1 Promising smallholder water and land management systems identified, evaluated, and disseminated.</p> <p>2.2 Uptake of appropriate systems promoted through increased institutional capacity of partners.</p> <p>2.3 Increased economic productivity of water by 20% over present use of water by those who have adopted such systems.</p>
INDICATORS	<p>OUTPUT 3. Sustainable Groundwater Management Promoted</p> <p>3.1 A more accurate and refined understanding of the socio-ecological value of groundwater, and the nature and scale of the consequences of its unsustainable use, developed and disseminated.</p> <p>3.2 Research knowledge on promising technologies and management approaches with potential to help achieve sustainable groundwater use, identified and promoted.</p> <p>3.3 Sustainable solutions explored and communicated to strategic players in national and regional groundwater systems.</p>
INDICATORS	<p>OUTPUT 4. Water Resources Institutions and Policies Analyzed</p> <p>4.1 Necessary tasks, policy tools, organizational designs, and institutional frameworks identified to achieve and sustain high productivity of water in irrigated agriculture and improve people's lives.</p> <p>4.2 Research-based guidelines identified, tested and evaluated for water policy reform, organizational options and roles, and support systems for local management of irrigation that lead to more effective management of water in river basins.</p> <p>4.3 Knowledge of internationally established best practices tested, validated and applied to specific regional or subregional contexts.</p>
INDICATORS	<p>OUTPUT 5. Linkages between Water, Health and Environment Understood</p> <p>5.1 Research, documentation and pilot field studies carried out to raise awareness and work towards the incorporation of health safeguards in water resources management and planning in rural and urban areas.</p> <p>5.2 Relationships among irrigation water management, health and the environment documented, and tools developed for an integrated planning and management approach.</p> <p>5.3 Practical tools developed to quantify and manage irrigation and drainage flows that can sustain ecosystems whilst obtaining optimum agricultural production.</p>
INDICATORS	<p>OUTPUT 6. Comprehensive Assessment of the Benefits, Costs and Future Directions of Water Management for Agriculture</p> <p>6.1 Analytical methods and tools available to assess the societal and ecosystem costs and benefits of water use.</p> <p>6.2 Identification and evaluation of important trade-offs between water for food security and the environmental conservation.</p> <p>6.3 Feedback into a global dialogue that will strive to gain consensus among key stakeholders from the irrigation, environment, and rural development communities on the role irrigated agriculture plays and should play in the future.</p>

Research Themes

The continuity of IWMI's research and its strategic priorities over the coming five years will be driven by the five Research Themes and by activities in a number of Benchmark River Basins to be located across the developing world. The Themes can be seen as five interconnected research missions for IWMI. The work of each Theme is guided by an action plan and specific targets to be attained.

IWMI will focus its research expertise on water and land resources problems through its Research Themes. Its unrestricted core funding will be used to strengthen work in these areas. In CGIAR terms, the Research Themes are Mid-Term Plan (MTP) Projects.

Complementing the work of the themes are the Benchmark River Basins, IWMI's "field laboratories." The Basins will be used to test IWMI concepts and tools in a real-life situation, and to gather data that can be fed back into the Institute's research. A further impact of these activities is the long-term partnerships that IWMI will forge with local universities, research institutes and national authorities in the countries where Benchmark Basins are located. Two Benchmark sites are being established in Sri Lanka, Pakistan and Southern Africa in 2001. By 2005 there will be some 10–12 such Basins across Asia and Africa.

REGIONAL OFFICES						
	Sri Lanka (Asia including China)	Thailand (Southeast Asia)	Pakistan (Central Asia/Middle East)	South Africa (Africa)	India	
RESEARCH THEMES	Integrated Water Management for Agriculture					
	Sustainable Smallholder Water and Land Management Systems					
	Sustainable Groundwater Management					
	Water Resources Institutions and Policies					
	Water, Health and Environment					

Integrated Water Management for Agriculture

Understanding irrigation in its true context. From field to river basin, looking at the needs of farms, communities, and nature.

- What kind of irrigation do we need?
- How can water management in existing irrigated areas be improved?
- How much irrigation do we need?
- We know that irrigated agriculture will play an important role in household, national and global food security. How can irrigation be managed to the benefit of all users in a river basin?

This research theme brings together much of the core of the Institute's expertise, knowledge base and research outputs that have been produced over the past five years. Over the coming five years, this research will be deepened—concentrating on the areas of irrigation management, river basin analysis and global-scale strategic analysis of water resources. A key focus of all research under this theme will be to look at irrigation management from the perspective of the competing uses of water in river basins, including agriculture, nature, local communities, cities, industry, etc.

Irrigated agriculture has many shapes, sizes and faces. These range from large storage, canal-fed surface systems to garden-level 'drip' irrigation; from farmer-managed to government-managed; from supply-based water deliveries to those that respond to farmer demand. We know that irrigation can have a profound impact on nature, local communities and other users of water in river basins, and that these consequences have often been neglected when irrigation is being developed and managed. There is a need to better understand these linkages and influences, and to evaluate options for developing and managing water more productively, for the benefit of all users in a river basin. The backdrop for this research is the increasing water scarcity that most developing countries are experiencing.

Through this Research Theme, IWMI will work with local partners in the locations where research is being done. Various technologies will be combined—such as satellite remote sensing and computer modeling—with other research tools to gain new insight into irrigation performance at different scales (field, farm, irrigation system, river basin). This research will generate new insight into the factors that contribute to better irrigation performance. It will help create tools and processes that developing countries can use to improve their understanding and management of water resources and irrigation.



IWMI will drive the 'rethinking' of the role of irrigation in food production, poverty reduction, and environmental security. To do this the Institute will capitalize on its knowledge and experience gained over the past decade, and work with government planners and policy makers, the national and international research communities and NGOs. This work will generate new knowledge, create new thinking and encourage new partnerships that are critical to the global debate on water-environment-food security; a debate that, today, is severely constrained by a lack of science-based knowledge.

OBJECTIVES

Develop and apply new research methodologies for assessing and improving the performance of irrigation water management in the context of Integrated Water Resources Management.

Identify key methodologies, processes and actions that will contribute to poverty reduction and food and environmental security.

IMPACTS/TARGETS

Better investments in water resources schemes and better management of water resources will lead to sustainable increases in the productivity of water– and better livelihoods for poor people in rural areas. As a result of these smarter investments, over a 20-year time horizon, we expect less environmental degradation and less poverty.

IWMI will achieve impacts using a three-pronged approach:

- Significantly influence how investments in irrigation development, improvement and management are made, by feeding results of relevant research into the global debate on water for food and environmental security.
- Develop and disseminate research tools to enhance the understanding of the most critical issues in the management of irrigation water.
- Provide tools, processes, and knowledge that allow water resources managers to adapt and respond to new and changing needs and expectations.

RESEARCH ACTIVITIES

1. Generate new knowledge on irrigation and water resources. This research will generate knowledge on the actions and processes needed to achieve sustainable improvements in water productivity in agriculture. We will explore a range of research questions, including:

- How can the productivity of water be enhanced through water management interventions?
- What interventions contribute to improved livelihoods for the poor?
- What are appropriate designs, operational procedures, and performance assessment procedures—both in large and small-scale irrigation systems?
- What irrigation practices lead to real water savings in a river basin?
- How do interventions in irrigation influence other important uses of basin-wide resources such as fisheries, or domestic uses?

2. Create tools and methods for Integrated Water Resources Management.

This topic will develop conceptual, research and assessment tools for managing water in irrigated agriculture, using an Integrated Water Resources Management approach. This work will combine and refine information and modeling tools to help address these complex issues. These include: IWMI-developed tools such as the PODIUM policy dialogue model, the World Water and Climate Atlas, the SLURP river basin-scale computer model, poverty and gender analysis, water accounting, satellite remote sensing and Geographical Information Systems, economic valuation, performance assessment, and other research tools and methodologies.

3. Comprehensive Assessment of the benefits, costs and future directions of water management in agriculture. This activity will conduct a comprehensive analysis of the benefits and costs of irrigation development over the past 50 years. The results of this work will generate new knowledge about the best options and future directions for irrigated agriculture. The analysis will examine impacts on food production, prices, poverty and the environment—at the global, local and community levels—in a number of developing countries. The assessment will receive input from a range of partners, in existing programs of international organizations (FAO, IUCN, ICID, etc.) and from many local initiatives. This knowledge will be used as input to the Global Dialogue on Water for Food and the Environment that will strive to gain consensus among key stakeholders in the irrigation, environment and rural development communities on the role that irrigated agriculture currently plays and should play in the future. Research products will include a map of irrigated areas—initially in key countries, followed by a global map.

IWMI Benchmark Basins

Making a dynamic portrait of natural resources management in river basins

How do river basins change in response to socioeconomic shifts, water scarcity or competition for water between different users?

Benchmark Basins are IWMI's field laboratories. In these locations, IWMI will validate its research and tools and collect data regularly over a 20-year period. Most importantly, each Benchmark site is a long-term partnership of local research institutions, government agencies and NGOs. They come together to study the Benchmark Basin's hydrology, its institutional arrangements for managing water and land, socioeconomic conditions, and health and environmental factors. This data will be collected, and analyzed by all partners, to present a dynamic portrait of the basin's natural resources management profile, as it evolves.

Benchmark Basins will be developed progressively and will potentially total 10 or 12. Most will be medium (such as Lerma-Chapala in Mexico—55,000 sq. km) to small in size (such as Kirindi Oya in Sri Lanka—1,200 sq. km).

The initial focus will be on developing a methodology and specified set of data for basins such as these. Some basins selected may be part of a 'mega-basin' (in Pakistan: Fordwah subbasin of Indus). In these cases, IWMI will attempt to develop a methodology and collect data that focuses specifically on the link between the mega-basin and its subbasins. This includes questions of monitoring change, and seeing how we scale up from the smaller to the larger basins.

Criteria for selecting Benchmark Basins

- **A priority for local partners:** The site is seen as an important one by IWMI's partners in terms of potential problems and issues such as growing scarcity and competition for water.
- **Potential impact:** IWMI and its partners believe that the problems to be addressed by research could have a significant impact on the improved management of water resources in that basin.
- **Build on past work:** For some basins, past work at IWMI has resulted in the establishment of excellent local partnerships, the identification of problems, and the assembly of a significant body of information.
- **Representative aspects:** The Benchmark Basins, when viewed together, will provide a good cross-section of the major resource environments and water resources management characteristics in the developing world.

Impact Assessment

Putting impact on the research agenda

IWMI does research for one reason: to have a positive impact on the activities and perspectives of policy makers, water managers and poor rural communities in developing countries.

The Institute's research strives for impact at three levels:

- The global impact of irrigation (water for food and environmental security).
- The individual impact of IWMI's various research projects.
- Capacity-building and the transfer of practical knowledge and tools to various levels of users in developing countries.

The impact of irrigation—past, present and future

This analysis of the benefits and costs of past irrigation development will take into account food security, poverty alleviation, and degradation of water and land resources caused by the intensification of irrigated agriculture. It will identify needs for further irrigation development and for improved management of water resources in an environment of growing water scarcity. This work is expected to have an important impact on water policy in developing countries.

Impact of proposals and individual research activities

Each IWMI project proposal includes a plan for impact assessment. While some impacts may not be experienced for a decade or more, a series of benchmarks should be established to determine whether or not the anticipated results of research are being achieved and to gauge or reassess the likely impact. At the individual project level, each project leader is responsible for assuring appropriate impact assessment for his or her projects.

Capacity-building and knowledge transfer

IWMI's longer-term wish is that it is remembered for improving the capacity of national partners and strengthening developing countries' research capacity in the field of water resources management.

Sustainable Smallholder Water and Land Management Systems

Identifying and evaluating water and land use innovations developed by poor communities. Promoting their transfer to benefit people in other areas.

In response to water scarcity, a diverse range of innovations suitable for very poor people have been developed to better manage water and land resources. Most of these innovations are developed by poor communities or at the grass roots level. They include treadle pumps, low-cost bucket and drip irrigation kits, supplemental irrigation systems, sustainable land management practices in rain-fed areas, groundwater use and recharge practices and techniques, and water harvesting systems. We refer to these various approaches, technologies and management practices as smallholder water and land management systems.

Smallholder practices are found primarily in upland and rain-fed areas. Initial indications distilled from past IWMI research are that these activities can considerably improve the livelihoods of the rural poor, by creating new income-generating activities, and hence better food security. Generally, these are simple and practical approaches that increase the productivity of water in agriculture, conserve land and other natural resources.

The research under this theme will concentrate on identifying promising smallholder innovations, then evaluating them together with partners—to understand how and why they work and what their impacts are. These innovations will be studied to see how they can be adapted for use in other poor areas. The research will seek to understand the conditions under which the high potential smallholder practices are viable, then support their uptake in developing countries and regions.

The evaluation phase will consider a range of aspects, including:

- The feminization of agriculture in marginally productive areas.
- The impacts that these practices have on the livelihoods of poor men and women.
- Scaling-up of nutrient, sediment and water flows in a river-basin context.

Particular attention will be paid to potential impacts of smallholder practices on the water, ecosystems, social and institutional aspects, as they are replicated across large areas.

The diverse disciplines of IWMI's scientific staff, and its international perspective, give the Institute a significant comparative advantage in bringing scientific scrutiny to smallholder innovations.

The Institute's international perspective and contacts will facilitate the exchange of knowledge and practices within countries, and between continents. An important part of this activity will be to build countries' institutional capacities to deal with water and land management more effectively and to facilitate the uptake of promising innovations.

OBJECTIVE

The objective of this theme is to promote the uptake of appropriate smallholder water and land management systems, that help improve the rural livelihoods of poor men and women, and drive increases in water productivity. Through this research, IWMI will identify, evaluate and disseminate knowledge. It will promote the uptake of promising smallholder water and land management systems.

OUTPUTS AND IMPACTS

Identifying and encouraging the use of smallholder water and land management systems will improve the lives of millions of poor people while driving sustainable increases in the productivity of water and land resources. These practices will reduce the stress on scarce water and land resources. To encourage the widespread use of smallholder innovations in communities across Africa and Asia, IWMI will work closely with NGOs that have broad coverage at the community level and have dissemination and social mobilization expertise.

IWMI will identify areas where there is scope for uptake, then provide impetus through partners to promote the widespread use of these practices. From these efforts, IWMI's work will encourage:

- Adoption of promising sustainable smallholder water and land management systems by 100,000 poor farmers in Asia and Africa within the next three years, and by 1 million smallholders over a five-year period.
- An increase in the economic productivity of water by 20% over the present use of water by those who have adopted the technology.
- Increased institutional capacity of target developing countries to support up-scaling. This will be indicated by the changed agendas of various agencies involved in this area.

RESEARCH ACTIVITIES

In Africa and South Asia, and later in China, IWMI will:

1. Identify promising smallholder water and land management systems.
2. Evaluate their potential for improving livelihoods—based on impact on incomes, poverty levels of men and women, the environment and water use.
3. Understand the institutional and environmental conditions under which the selected innovations work, and the reasons for their adoption or non-adoption.
4. Evaluate how they will scale-up by considering flows and movement of soil, water, and nutrients, and the institutional consequences of widespread uptake.
5. Provide implementers and extension specialists with suggestions on how these techniques could be adapted to better match local situations.
6. Estimate the potential global impacts where there is widespread uptake.
7. Promote the exchange of useful community-level practices and experience, through cross-learning within and between Asia and Africa.
8. Work with NGOs and extension services to promote the uptake of these approaches.
9. Assess the impact of this uptake on incomes and household security.



Sustainable Groundwater Management

Providing a more precise understanding of the socio-ecological problems surrounding groundwater. Aggressively promoting solutions for its sustainable use in developing countries.



Since 1950, the bulk of the developing world's public investments in the water sector has been directed at building canal irrigation infrastructure to divert surface water for agricultural use. At the same time, an ever-growing share of irrigation in these countries is delivered by groundwater extraction. This is financed by millions of individuals and other private investments, purchasing water pumps and drilling various types of wells.

India, Pakistan, China and the United States are the biggest users of groundwater. This is mostly for irrigation but also for domestic and industrial requirements. Many other countries depend less on groundwater, yet they face acute problems of overexploitation especially in cities and industrial areas.

Groundwater is becoming an increasingly popular resource because of the relative ease and flexibility with which it can be tapped. It can be drawn on demand, making it far more attractive to many groups of users. Many observers argue—and indicative evidence supports this—that a cubic meter of groundwater creates several times more income than a cubic meter of water from large surface irrigation systems. Some experts believe that most surface irrigation systems built in Asia over the past 40 years would have become bad investments today—were it not for the vibrant pump irrigation economies they now support by recharging groundwater aquifers.

Groundwater is emerging as a formidable poverty reduction tool. This water can be delivered directly to poor communities far more cheaply, quickly and easily than canal irrigation water. Subsidies for tube wells are high on the list of South Asian poverty alleviation programs.

The developing world's groundwater scene poses three major challenges:

- The potential for development of large, currently untapped groundwater aquifers in several regions of the world—including the Ganga-Meghna-Brahmaputra basin in South Asia, and areas of Vietnam, Laos and South China.
- The limited but even less-developed groundwater in much of Africa. Here the challenge is to sustainably develop and manage this potential, for the benefit of poor people.
- The most formidable groundwater challenge is to attain the sustainable use and management of groundwater in vast and growing regions where the resource is under threat. The over-depletion of groundwater is becoming a major problem in the North China plains, in western and peninsular India, and in urban areas across Asia.

According to Sandra Postel, the world overdraws 200 km³ of its global groundwater 'bank account' every year. Probably more than 66% of this overdraft occurs in India, placing this country's food and livelihood security at great risk. According to David Seckler, IWMI's former Director General, over 25% of India's harvest is in areas where groundwater is being seriously overexploited.

Groundwater overdraft has many negative consequences. The most far-reaching impact of groundwater depletion and water quality deterioration is on the health of large sections of rural populations, that depend directly on wells as their only source of drinking water supply.

Other examples are:

- In western and peninsular India, overuse of the resource is depleting water tables. Groundwater mining is causing the drilling of ever-deeper wells and an ever-increasing cost of tapping these aquifers.
- In India's Gujarat and Rajasthan States, groundwater overuse is causing fluoride contamination of drinking water supplies, creating a major public health crisis.

In Bangladesh and West Bengal, overexploitation causes arsenic contamination of groundwater.

- In coastal India, overexploitation of groundwater results in high levels of salinity in the water, making it unfit for human consumption or farming.
- In Pakistan's Indus River system, a major challenge is how to deal with secondary salinization of water and land. This is caused by inappropriate practices for the combined use of surface water and groundwater.

OBJECTIVES

The goal of IWMI's groundwater research program is to help countries, regions and local communities achieve sustainable use and management of groundwater, in ways that promote food and livelihood security for the poor women and men in Asia and Africa.

The specific objectives are:

- To develop and disseminate a more accurate and refined understanding of the socio-ecological value of groundwater, and highlight the scale and consequences of its unsustainable use.
- To identify promising technologies and management approaches. To research, evaluate and promote their potential to help achieve sustainable groundwater use.
- To aggressively promote solutions for sustainable groundwater use, among strategic players in national and regional groundwater systems.

OUTPUTS AND IMPACTS

The key outputs of IWMI's groundwater research will be a series of research products—publications, models, analytical tools and policy papers. A significant portion of time and resources will be devoted to distilling practical lessons from ongoing field research and engaging strategic players—that are active from the policy to the community levels—in discussing ways of putting sustainable groundwater management into action.

RESEARCH ACTIVITIES

The starting point for this Research Theme is intensive work in South Asia and Africa in 2001. The research will be extended to Southeast Asia and China in 2002.

It is focused on five areas of activity:

1. Assessing groundwater resources: reassessing available data and using technology tools—particularly satellite remote sensing and geographical information systems—to create a detailed picture of groundwater situations and use patterns. The initial focus will be on several key countries, starting with Pakistan and India, and grow into a global groundwater assessment.
2. Collecting and synthesizing past and current scientific work to reexamine important technical and behavioral relationships related to groundwater. To formulate a realistic assessment of opportunities and threats.
3. Commissioning of location-specific studies that shed new light on groundwater management problems, particularly socio-ecologic issues.
4. Gathering information and analyzing approaches that have worked elsewhere in the world and assessing their applicability to the situation of South and South-East Asia and North China. This includes looking at groundwater use and salinization through modeling and field experiments.
5. Conduct an ongoing synthesis of emerging practices and findings by other groundwater researchers, and integrating this into a groundwater policy analysis. This will include the verification of the key scientific theses, and work to develop practical demand and supply side tools for better groundwater management.

Capacity Building

Improving our skills and those of our partners

Capacity-building is the direct link between research and the impact—or uptake of research knowledge. IWMI's capacity-building plan calls for action in six areas:

- **Policy Roundtables:** Roundtable discussions will be organized for the highest possible level of target group (Ministers/Secretaries). Presenters will be internationally known persons. This activity will help open access to top-level decision makers to create awareness of water issues and innovative IWMI-researched policy options.

Target: 2–3 policy roundtables per year, initially in India, Sri Lanka and South Africa.

- **IWMI PhD Scholarship program:** IWMI is developing 'sandwich' programs with several universities in the North and the South. PhD students will do their research as part of the IWMI research program, and will be supervised by IWMI scientists.

Target: 25 PhD Fellows from the South in the next five years.

- **NARS partnership program:** Long-term relationships will be established with excellent universities and research institutes in Asia and Africa under the theme 'IWMI's Excellence in Water Resources Management Education Program'. Sabbaticals and Fellowships will be offered to university staff, who will be encouraged to write lecture notes and other course material based on IWMI-generated knowledge. IWMI staff will reciprocate by lecturing at these universities.

Target: 10 stable, long-term institutional partnerships developed over the next five years.

- **IWMI Postdoctoral Fellowship program:** The majority of fellows will be selected from the South and included in IWMI staffing and research proposals.

Target: 30 PostDoc Fellows from the South in the next five years.

- **Private Sector program:** A program offering private sector consulting firms and institutes the opportunity to second staff to IWMI for three to six month periods as Visiting Scientists. The program will also be open to public sector organizations, NARS and NGO representatives.

Target: 25 Visiting Scientists in the next five years.

- **Workshops: Seminars and Short Courses.** As a part of research projects, training sessions, workshops, seminars and hands-on training are being conducted. The Institute will help develop training material for university classes and short courses.

Target: 1 to 2 short courses per year.

Change Projects

Transforming IWMI into a 21st century research organization

Improving *how* we do business improves *what* we deliver (...impact)

IWMI has identified four organizational change projects that will significantly increase the Institute's effectiveness as a research organization.

These projects can best be put into action in cooperation with other CG centers (and IARCs)—to gain economies of scale and encourage streamlining of administrative functions, where this makes sense.

Timewriting project

This information system will integrate project planning (budgeting) and project implementation (timewriting) with the financial administration system. All research activities in all locations will be recorded and tracked, to produce useful information such as: monthly figures on the progress and status of each project, monthly feedback by region, and research theme for the Institute.

Intranet/Extranet project

The planned IWMI Intranet/Extranet will be an electronic platform that links all IWMI offices around the world. It will provide instant access to administrative and financial information, research and project details, data and other useful information that drives the running of the Institute. When completed, the IWMI Intranet/Extranet will provide access to real-time project management and administrative functions through a secure website. This project has real potential as a CGIAR Global Challenge project to benefit all centers.

Targets: 2001–2002—Phase 1 Intranet that replaces internal memoranda and general e-mail messages in the Institute. 2002–2004—move important processes to the Intranet, shared among all IWMI locations. Five-year objective—communication between all offices through the Intranet, also for video-conferencing and similar applications.

Database project

This project aims to organize and package the data generated through IWMI's past research and make it readily available to all interested users in a practical form. A research data archive will give access to all datasets. This initiative will play an important role making data available from IWMI's Benchmark Basins in a practical format.

Quality project

The Quality project aims to update and streamline the various Institute policies and procedures, by putting in place a Total Quality Management System against which all aspects of the Institute's work can be measured and improved.

Water Resources Institutions and Policies

Studying and proposing "best institutional and policy practice" for water management in developing countries. Creating a lasting network of institutional policy research groups to drive change.

This research theme focuses on understanding how governments, communities and entire societies change their habitual behavior in managing water resources when faced with water scarcity. To gain this insight requires a detailed study of laws and rule-making, policies and institutional arrangements in developing countries—ranging from the community to the regional and national levels. The goal of this research is to produce knowledge-based guidelines and best practices in institutions and policies that allow countries to deal with specific types of water management problems.

IWMI has considerable experience in researching questions relating to water management and institutions. During its first decade, IWMI did extensive work in more than 15 countries. It produced influential results highlighting effective approaches to Irrigation Management Transfer (IMT), from government agencies to water user and farmer organizations. Research reports published by IWMI on this topic have become an important resource. They are used frequently by many groups of specialists when designing new institutional strategies for effective water management programs. This group includes international organizations, government agencies, research institutes and experts from developing countries.

As IWMI's research focus evolved from irrigation management to water resources in the river basin context, the Institute's institutional and policy research also included the river basin perspective. Since 1995 research has focused on river basin institutions and management.

This research theme deals with institutional and policy implications of:

- Strategies for enhancing the productivity of water (at national, basin and local levels).
- Building Poverty and Gender concerns into national and subnational water management regimes.
- Managing water scarcity and its consequences.
- Farmer-led/participatory irrigation management.

OBJECTIVES

The specific objectives of this research under this theme are to:

- Understand the institutional arrangements and policy frameworks that have the highest potential to improve the productivity of water in ways that promote livelihoods for poor men and women, and environmental sustainability. This will be done through a program of thorough systematic comparative research.

- Identify, test and evaluate research-based guidelines for water policy reform that lead to more effective management of water in river basins. The avenues explored will include organizational options and roles and support systems for the local management of irrigation.
- Test and validate the application of internationally established best practices so that they are effective in the regional and subregional contexts.

OUTPUTS AND IMPACTS

Close partnerships will be developed with some 25 institutions in 8-10 IWMI priority countries, to create a network of institutional and policy research groups that will share research results.

The outputs and impacts of this work may not be easily amenable to quantification. But verification will be possible through a qualitative assessment. The following targets will guide the research focus of the Water Institutions and Policies research theme. This research will:

- Significantly facilitate and influence the process and design of the Catchment Management Agency as it evolves in the Olifants river basin in South Africa.
- Significantly shape and influence the development of Pakistan's Irrigation Management reform program.
- Organize 25 Policy Dialogues over five years, and do necessary follow-up activities to ensure that the IWMI Policy Dialogue emerges as a significant platform for raising and discussing frontline water policy issues on an annual basis—in India, Pakistan, China and South Africa.

The outputs of this theme will be applied to institutional and policy research products, such as guidelines and examples of best practices from other countries and river basins. These products will be targeted at national policy makers and at the international and national research communities.

RESEARCH ACTIVITIES

1. Producing case studies of innovative and large-scale water-sector institutional and policy reform programs and an ongoing synthesis of the lessons learned.
2. Financing water service delivery mechanisms.
3. Analyzing the negative gender and poverty impacts of: water scarcity, river basin "closing," competition for water in basins, and exploring strategies for mitigating these.
4. Analyzing institutional arrangements for river basin management to identify best practices that can be transferred to help others.
5. Analyzing water conflicts and alternative approaches to managing them.
6. Water policy modeling and scenario generation, as with the policy dialogue model, PODIUM.
7. Policy analysis, using a comprehensive, multidisciplinary, issue-based approach.
8. Policy roundtables, consultations and other mechanisms for research-based advocacy, supported by the targeted dissemination of research results to achieve maximum impacts.



Water, Health and Environment

Putting health and environmental issues on the water management agenda. Creating tools to better address the health and environmental aspects of water in agriculture.

Freshwater is essential for human survival. The quantity, quality and presence of disease-causing or transmitting agents in water have a direct impact on human health. Agricultural water use in general, and irrigation in particular, affect health because they bring water into close contact with people, and are expected to enhance health by increasing crop production and consumption. While agricultural water's primary purpose is to supply water for crops, it is also a major source of domestic water used in households across the developing world (for bathing, cooking, etc.). Attention to health impacts should be more integrated into the thinking and practices of the agricultural water management sector.

From an environmental perspective, water that is not consumed for human purposes (agriculture, domestic and other needs) maintains a host of natural ecosystems. These systems sustain biodiversity, and frequently bring value to people—in the form of ecosystem-derived goods and services—such as fish farming, the collection of medicinal plants, tourism, etc.

The withdrawal of water for irrigation can reduce the flows of freshwater needed to sustain natural resource areas. Irrigation drainage can disturb the ecological balance by carrying excess chemical nutrients and pollutants into these ecosystems. Inflows of drainage water into brackish water ecosystems can lead to changes in water quality and levels that have a negative impact on biodiversity, lead to degradation of ecosystem resources and reduce the incomes of the dependent stakeholders. The environmental dimension of water should also receive more attention within the irrigation sector.

Water use in agriculture and its impact on health and the environment are the focus of this research theme. We view research on health and nature in the overall context of ecosystem management, where “maintaining the sustainability of the ecosystem” means safeguarding the health of people that use it contains and the wealth of natural resources.

SUBTHEME: WATER AND HEALTH

Objectives

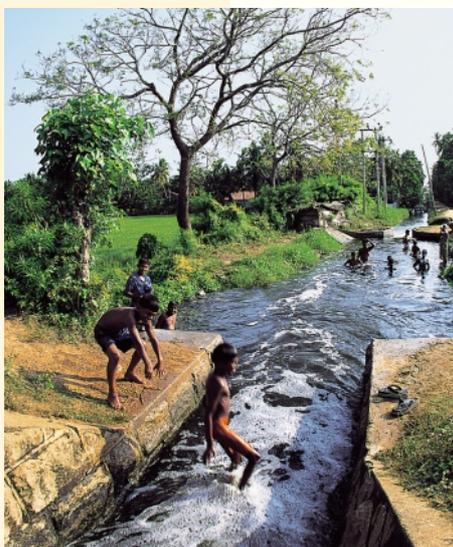
The Health subtheme bridges the gap between the water and health sectors. Through research, documentation and field studies, the theme works to raise awareness and encourage the incorporation of health safeguards in water resources management practices and planning in rural areas.

Under this theme, studies will be done in areas such as malaria control using water management, and improving the water and sanitation situation in irrigated areas. It works through partnership with national agencies in the health and water sectors (e.g., antimalaria programs and water and sanitation agencies) in target countries, with local universities and with research institutes.

Other key partners are local and international NGOs that have broad access to local communities where information can be gathered and concepts tested.

Outputs and Impacts

- Research products include publications in peer-reviewed international journals, IWMI research reports, etc. Impact can be measured in terms of citations of these products in the scientific literature.
- Capacity-building, measured by the number of people trained, inputs into university courses, and partner institutes strengthened.
- IWMI presence and/or input at policy and project level in International, National and NGO initiatives.



- IWMI and partner involvement in testing methodologies, approaches and techniques, measured in terms of impact on disease transmission or household economies.

RESEARCH ACTIVITIES

This theme uses empirical and secondary information to research specific aspects of the water and health conundrum. It is developing:

1. Ways to use water management to control mosquito-borne diseases.
2. Measures to reduce schistosomiasis linked to dams and irrigation.
3. Guidelines to reduce water-borne and water-washed diseases in relation to irrigation management.
4. Tools to analyze health linkages between irrigation water management and domestic water supplies.
5. Methodologies to assess health impacts of the reuse of wastewater for agriculture.
6. Analyses of the linkages between health and poverty in all of the above activities.

The geographic focus of this work will be South Asia (including Pakistan) and sub-Saharan Africa. Work in Africa will focus on water-related diseases linked to small dams and irrigation structures, and multipurpose water resources development.

SUBTHEME: WATER AND ENVIRONMENT

Objectives

The environment subtheme of this research program will bridge the gap between the irrigation and environment (conservation) sectors. It will scientifically document the relationship between irrigation water management and the environment in an integrated manner. This work will focus on developing practical solutions to quantify and manage irrigation and drainage flows in a way that sustains ecosystems while obtaining optimum agricultural production.

Outputs and Impacts

- Research products will include publications in peer-reviewed international journals, IWMI research reports, etc.
- Improving the capacity of national environmental and research institutes and government agencies in the countries where projects are running.
- IWMI presence and/or input at policy and project level at International, National and NGO initiatives.
- IWMI and partner involvement in implementation, measured in terms of impact on ecosystem goods and services, and on stakeholder economies.

Research Activities

This theme's research will use empirical and secondary data to examine water-environment questions, in the context of the interactions and competition for resources between agricultural and environmental uses. Important research topics include developing:

1. Tools to assess the water requirements of ecosystems/wetlands.
2. Guidelines to increase the productivity of water in ecosystems
3. Methods to evaluate the environmental impacts of agricultural water use including wastewater irrigation.
4. Principles and operational guidelines for water allocations in river basins.
5. Tools for valuing ecological goods and services.

IWMI will participate in global networks and initiatives such as the "River Basin Initiative," and "Millennium Ecosystem Assessment" led by the World Conservation Union (IUCN); and UNESCO's International Hydrology/HELP programme.

IWMI has completed water-environment research in Turkey and has an ongoing program in Sri Lanka. It also has potential new research in IWMI Benchmark Basins and other rivers in Pakistan (Indus), eastern and southern Africa (Limpopo), and southeast Asia (Mekong). Developing a program of research on wetlands in southern Africa will be an important activity during the next five years.

Global Dialogue on Water for Food and the Environment

IWMI is a founding member and a catalyst behind the creation of the Dialogue on Water, Food and Environment, an important new research that aims to bring together the agricultural and environmental communities. The Dialogue's purpose is to work toward a knowledge-based consensus between these two communities, on the present and future needs of water for food production, livelihoods, health and nature in developing countries.

The current partners in this initiative are: Food and Agriculture Organization (FAO); Global Water Partnership (GWP); International Commission on Irrigation & Drainage (ICID); World Conservation Union (IUCN); International Water Management Institute (IWMI); United Nations Environmental Program (UNEP); World Health Organization (WHO); and World Water Council (WWC).

The process started in December 2000 when over 130 stakeholders from around the world came to a planning and design meeting in Colombo to help shape the Dialogue initiative. An agenda with points for action has been agreed between all partners, and the group is now planning for specific action. A Consortium was formed at a meeting in March 2001 at FAO. A Dialogue Secretariat is planned to be hosted by IWMI. IWMI Director General Frank Rijsberman was elected the first Chair of the Consortium.

IWMI will lend its expertise specifically to a component of the Dialogue, a *Comprehensive Assessment of the Costs and Benefits of Water Management for Agriculture*. This assessment will look at the global situation of water management for agriculture since 1950 to the present. It will conduct studies in a number of ecosystems where there is likely to be a competition between the need to expand food production and maintain local wetlands and other natural systems.

The assessment is one of the several components in the Dialogue's Knowledge Base, centered around water use, agriculture and environmental/ecosystem management topics. This research, data and findings will feed knowledge into the policy-level Dialogue process. The other two main blocks in the Dialogue are: 1) national-level cross-sectoral dialogues; and 2) an information exchange platform to generate best practices from large numbers of innovative local-scale action projects.

IWMI's work on the Comprehensive Assessment is a continuation from the earlier CGIAR Systemwide Initiative on Water Management (SWIM)—and is therefore also referred to as SWIM-2.

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Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Develop and apply new research methodologies for assessing and improving irrigation water management performance in an integrated water resources management framework.

Purposes

1. Provide knowledge on actions and processes to achieve sustainable improvements in water productivity in agriculture.
2. Develop and update tools and methodologies for water resources assessment.
3. Identify, evaluate and disseminate sustainable options for increasing water productivity, poverty reduction and environmental sustainability.
4. Strengthen research and institutional capacity of partners to manage water for future food and environmental security.

Outputs

- Updated knowledge for integrated management of water in a basin context.
- Improved tools for assessment, accounting, planning and use of water resources.
- New methodologies for interdisciplinary research and contextual analysis.
- Integration of knowledge through research and compilation of best practices.
- Practical guidelines on improving the performance of selected reference basins.

Achievements in 2000

- Global Water Scarcity/Supply and Demand work completed (analysis of the situation in 118 countries).
- IWMI's Water Scarcity work presented at the second World Water Forum in The Hague. IWMI's several scenarios produced for the Forum, served as a basis for the World Water Vision's Water for Food and Rural Development component.
- Water Accounting and performance studies integrated into river basin institutions analysis in a five-country river basin study.
- Research in China and in East Africa on options for growing more rice with less water.
- Some 50 international research publications, including journal articles, peer-reviewed research reports, symposia/workshop papers, chapters in books, etc.

Milestones

- 2001: More rice, less water work complete; water accounting, performance studies initiated at benchmark basins considering irrigation in an integrated water management framework.

- 2002: Results of water productivity determinants study in India and Pakistan; further research with CG centers on water productivity defined; conceptual and analytic (hydrological and economical) tools developed for exploring trade-offs in basin-wide water use.
- 2003: Guidelines for improving performance of basin-wide water use at benchmark basins, plus generic guidelines and practical tools developed for a variety of situations to sustainably and equitably improve the productivity of water.
- 2004: Practical guidelines for saving water, improving productivity of water; analytical tools to assist putting these practices in place.

Gains

- Sustainable and productive management of water and land resources through better assessment tools, and research-based policy and management interventions.
- Improved practices for increasing the productivity of water at farm, system, and basin scales.
- Improved assessment of the economic value of land, water and environmental resources.

Duration

Indefinite.

Costs (in million US dollars)

2001: 2.6; 2002: 2.6; 2003: 2.89; 2004: 3.2

Users

Farmers, water managers, planners and agencies concerned with policies and practices for irrigation and the use of water resources; irrigation, health and environmental authorities; water user associations and related civil society organizations (CSOs); NARS and universities for research methodologies.

Collaborators

CARE/Nepal; Chinese Council on Agricultural Policy; International Rice Research Institute (IRRI); CIMMYT; International Program for Technology Research in Irrigation and Drainage (IPTRID); Wuhan University, China; Asian Institute of Technology; Cornell University, IHE Delft; Iranian Agricultural Research and Engineering Training Institute, NARS Irrigation Departments and Water Management Authorities in countries where research is conducted.

CGIAR Logframe Output Linkages

Output 3, sustainable production systems and natural resources conservation: 50%; Output 4, improved policy analyses and techniques: 30%; Output 5, enhancing performance of research and related institutions: 20%.

Financing Plan

Governments of Switzerland, Canada, France, Japan, Netherlands, Australia, Asian Development Bank, International Fund for Agricultural Development, African Development Bank, the World Bank, USA, and United Kingdom.

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Extend benefits of smallholder systems to millions of poor people, as well as reduce stresses on scarce land, water and environmental resources, by achieving sustainable increases in the productivity of water and land.

Purposes

Promote the uptake of appropriate smallholder water and land management systems in order to contribute to better rural livelihoods of poor women and men. Specifically, through this MTP Project, IWMI will identify, evaluate and disseminate knowledge, and promote the uptake of promising smallholder water and land management systems.

Outputs

- Promising smallholder water and land management systems identified and evaluated for impacts on incomes, poverty, environment and water use.
- Analysis of institutional, socioeconomic and cultural conditions under which smallholder systems can work, and guidelines for successful uptake and upscaling.
- Evaluation of impact, in terms of flows and movement of soil, water, and nutrients and institutional consequences of widespread uptake.
- Guidelines to implementers on how these techniques could be adapted to better match local situations.
- Estimation of the potential global impacts if there is widespread uptake.
- Cross-learning within and between Asia and Africa.
- Strengthened capacity of NGOs and extension services to promote the uptake of these approaches.

Achievements in 2000

- Rapid reconnaissance of promising smallholder water management innovations carried out.
- Contacts and collaborative links established with NGOs actively involved in promoting innovations on the ground (e.g., PRADAN-an NGO in India, International Development Enterprises-IDE).
- Field research started to understand the determinants of success of innovative water harvesting and irrigation technologies and identify mechanisms and impacts of up-scaling.

Milestones

- 2001: New program established with stakeholders for integrated water and land management by smallholders in upland areas. Workshops held and reports published of ongoing activities.

- 2002: New programs implemented in at least 3 of IWMI's regions, and projects started in which farmers, NARES, and ARIs participate. International symposium on results of catchment research. Integration of research in this theme with that of other IWMI themes reviewed.
- 2003: New results to prove synergy of joint water and land management in Africa and Asia discussed and published internationally. Consequences for smallholders of widespread water and land degradation are documented and given broad awareness.
- 2004: Project impact established for widespread adoption of improved water and land management technologies. Capacity-building in Africa and Asia on research for integrated water and land management is successful.

Gains

Improved rural and urban livelihoods due to sustainable increases in productivity of water and land, and reduced degradation of these natural resources.

Duration

Indefinite.

Costs (in million US dollars)

2001: 3.15; 2002: 3.15; 2003: 3.15; 2004: 3.15

Users

Smallholders in Africa and Asia will benefit from IWMI-developed technologies. NARES will develop and test with IWMI appropriate technologies. Research programs will make curricula at Universities stronger. Policy makers will get better options for sustainable natural resources management. Researchers, including those at CGIAR centers, will benefit from a more effective range of techniques and tools in water and land management.

Collaborators

NARES in interested countries in Asia and Africa, other CGIAR centers (including ICRAF, IRRI, IFPRI, CIP, CIAT, WARDA) and ARIs (IRD, IFDC). Secondment of staff from professional institutions will be encouraged.

CGIAR Logical Framework Output Linkages

Output 3, sustainable production systems and natural resource conservation: 60%; Output 4, Improved policy analyses and techniques: 10%; Output 5, enhancing performance of research and related institutions: 30%.

Financing Plan

Governments of Switzerland, Canada, France, Netherlands, Australia, Asian Development Bank, International Fund for Agricultural Development, African Development Bank and the World Bank.

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Contribute to achieving sustainable use and management of groundwater in ways that promote food and livelihood security for the poor women and men in Asia and Africa.

Purposes

1. Develop and disseminate a more accurate and refined understanding of the socio-ecological value of groundwater, and the nature and scale of the consequences of its unsustainable use.
2. Identify and promote research on promising technologies and management approaches with potential to help achieve sustainable groundwater use.
3. Aggressively promote sustainability solutions amongst strategic players in national and regional groundwater systems.

Outputs

- Collection and synthesis of past and ongoing scientific works to reexamine important technical and behavioral relationships and to formulate a realistic assessment of opportunities and threats.
- Location-specific studies that throw new light on groundwater management problems, in particular socio-ecologies.
- Gathering information on and analysing approaches that have worked elsewhere in the world and their applicability to the situation of South and South-East Asia and North China—including applied research on the complex of groundwater use and salinization through modeling and field experiments.
- Ongoing synthesis of emerging learning into a groundwater policy analysis, the verification of its key scientific theses, and the development of practical demand and supply-side approaches.

Achievements in 2000

- A special workshop designed and led by IWMI on "Sustainable Groundwater Management" at the World Water Forum at the Hague in March 2000. A global overview paper developed and presented.
- IWMI's draft report on "Wells and Welfare in Ganga Basin" used as the basis to modify an INR 1.5 billion scheme to promote small pumps for smallholders in North Bihar.
- IWMI's report on "Pedaling out of Poverty: Social Impact of Manual Irrigation."
- Technology in South Asia (Research Report 45) helped International Development Enterprises take a major relook at their treadle pump marketing strategy.
- IWMI initiated some work on groundwater recharge movement in Saureashtra region of Gujarat that faces acute groundwater drought. The IWMI paper has catalysed much broad-based research in the

popular science underlying this and ways of propagating these ideas laterally.

Milestones

- 2001: A more refined picture of ground water socio-ecology in South Asia is created, presented and widely discussed through 6 research papers and 8 policy briefs.
- 2002: The refined picture of groundwater socio-ecology is expanded to cover China and South East Asia in an attempt to create a global picture. Exploratory analyses of demand and supply-side management strategies are carried out. These outputs are shared in the form of 5 country studies and 8 policy briefs.
- 2003: A generalized strategic framework for sustainable groundwater management is developed, that covers in an integrated way the technical, institutional and policy aspects. This strategic framework will be founded on a multidisciplinary analysis and good science, and is to serve as core input in developing regional and subregional strategies for sustainable groundwater management during 2004 and 2005.

Gains

Improved management, sustainable uses and higher value from groundwater resources. Enhanced management and institutional capacities of partners.

Duration

Indefinite.

Costs (in million US dollars)

2001: 1.3; 2002: 1.82; 2003: 2.39; 2004: 3.02

Users

Irrigation agencies, WUAs, related NGOs, policy makers and groundwater authorities in Africa and Asia. Researchers, including those at CGIAR centers, will benefit from a more effective range of tools in groundwater management.

Collaborators

NARES in interested countries in Asia and Africa, other CGIAR centers and ARIs. Secondment of staff from professional institutions will be encouraged.

CGIAR Logical Framework Output Linkages

Output 3, sustainable production systems and natural resource conservation: 40%; Output 4, Improved policy analyses and techniques: 30%; Output 5, enhancing performance of research and related institutions: 30%.

Financing Plan

Sir Ratan Tata Foundation, Governments of United Kingdom, Canada, Netherlands, and Australia, Asian Development Bank, African Development Bank and the World Bank.

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Identify the necessary tasks, policy tools, organizational designs, and institutional frameworks to achieve and sustain high productivity of water in irrigated agriculture and improve people's lives.

Purposes

1. Understand, through systematic comparative research, institutional arrangements and policy frameworks most appropriate to improving the productivity of water in ways that promote livelihoods for poor men and women, and environmental sustainability.
2. Identify, test and evaluate research-based guidelines for water policy reform, organizational options and roles, and support systems for local management of irrigation that lead to more effective management of water in river basins.
3. Test and validate the application of knowledge of internationally established best practices to specific regional or subregional contexts.

Outputs

- Case studies of innovative and large-scale water-sector institutional and policy reform programs and ongoing synthesis of lessons.
- Synthesis of knowledge on water markets and mechanisms for financing water service delivery.
- Analysis of negative gender and poverty impacts of water scarcity, basin closure and competition, and exploring strategies for mitigating these.
- Analysis of institutional arrangements for river basin management to identify best practices applicable to different contexts.
- Analysis of water conflict and alternative approaches to managing them.
- Water policy modeling and scenario generation, as with PODIUM.
- Comprehensive, multidisciplinary, issue-based policy analysis.
- Policy roundtables, consultations, and other mechanisms for research-based advocacy and targeted dissemination of research results for maximum intended impacts.

Achievements in 2000

- Completed research on "well-functioning" river basins and water resources systems to validate necessary institutional arrangements.
- International workshop on tasks and institutional arrangements for river basin management, held in Loskop Dam, South Africa.
- Institutional case studies of five selected river basins in Asia, and case studies of best practices in three advanced basins in Australia, Japan and Indonesia.

Milestones 2001:

1. Workshop on integrated water resources management in a river basin context, based on in-depth institutional and performance studies in selected river basins in Asia.
2. Five journal articles and a book based on comparative analysis of selected river basins on the essential tasks and most successful techniques and institutional arrangements.
3. Initiate action research in selected countries involved in field research on integrated water resources management.
4. Initiate research on pro-poor interventions in irrigation in six selected Asian countries.

Milestones 2002:

1. Regional workshop in Asia on experiences with water resources institutional reforms.
2. Publications synthesizing research in 10 countries on sustainable irrigation management in water-short basins.
3. Initiate research on analysis and management of water-related conflicts among different geographical units.

Milestones 2003:

1. Application of institutional framework for river basin management in selected countries.
2. Complete research on pro-poor interventions in irrigation in selected Asian countries.
3. Action research in selected African countries on institutional reforms for water resources management.

Milestones 2004:

1. Complete research on conflict analysis and management in selected river basins.
2. Develop and assist in application of policies on pro-poor interventions in irrigation in selected Asian countries.

Gains

- More comprehensive and effective tools to define issues, such as water poverty; and facilitation of strategic planning, analysis, and legal and institutional reform processes in the water sector.
- More appropriate and sustainable management and institutional models at the community, systems and basin levels for integrated management of water for multiple uses.
- Enhanced capacity for research, policy and institutional analysis among partners.

Duration

Indefinite.

Cost (in million US dollars)

2001: 2.81; 2002: 2.81; 2003: 2.81; 2004: 2.81

Users

Irrigation and water resources managers, policy makers and planning, NARES dealing with water and agriculture.

Collaborators

National and regional research institutes; irrigation and water management agencies, WUAs, and related NGOs, and universities in South and Southeast Asia, China, and Sub-Saharan Africa.

CGIAR Logical Framework Output Linkages

Output 4, improved policy analyses and techniques 70%; Output 5, enhancing performance of research and related institutions: 30%.

Financing Plan

The Governments of Germany, United Kingdom, France, Japan and South Africa; Asian Development Bank, Ford Foundation and the World Bank.

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Bridge the gaps between irrigation, health and the environmental sectors. It will scientifically document the relationships between irrigation water management, health and the environment in an integrated manner. Focus will be on practical solutions to quantify and manage irrigation and drainage flows that can sustain ecosystems whilst obtaining optimum agricultural production. A related objective is to raise awareness and work toward the incorporation of health safeguards in water resources management and planning in rural and urban areas.

Purposes

1. Empirical and secondary information based research on specific aspects of the water and health conundrum.
2. Empirical and secondary information based research on specific aspects of water and environment within the context of the interactions and competition for resources between agricultural and environmental uses. Major focus on:

Outputs

Health:

- Ways to control mosquito-borne disease transmission through water management.
- Measures to reduce schistosomiasis linked to dams and irrigation.
- Guidelines to reduce water-borne and water-washed diseases in irrigated areas.
- Tools to analyze health linkages between irrigation and domestic water supplies.
- Methodologies to assess health impacts of reuse of wastewater for agriculture.
- Analysis of linkages between health and poverty in all of the above activities.

Environment:

- Tools to assess water requirements of ecosystems/wetlands.
- Guidelines to increase the productivity of water in ecosystems.
- Methods to evaluate environmental impacts of agricultural water use.
- Principles and operational guidelines for water allocations in river basins.
- Tools for valuing ecological goods and services.

Achievements in 2000

- IWMI established itself as the leading institute in the field of water management for disease-vector control. A large number of papers were published in international scientific journals and IWMI staff was

regularly invited by the World Health Organization and others to provide inputs to conferences and missions to malaria endemic countries. IWMI has taken up the challenge of developing a new major systemwide initiative on malaria and agriculture as requested by the Centers Directors Committee at ICW in October 2000.

- In 2000, IWMI has claimed a more prominent role in the environmental sector by actively participating in several international initiatives such as the UNESCO HELP program, becoming a member of the IUCN, and organizing the 'Dialogue on Water for Food and Environmental Security.'

Milestones 2001:

1. Risk map for malaria in Sri Lanka completed.
2. Research on the relation between waterlogging and malaria in Pakistan completed.
3. New research projects on reuse of wastewater for irrigation started in Pakistan and Vietnam.
4. Available datasets on water flows, water quality, flora, fauna, and resource use of the Kirindi Oya Irrigation Scheme and wetlands of the Bundala National Park analyzed and disseminated at a major stakeholder workshop organized together with other stakeholders.
5. Tested methodologies and general guidelines for the assessment of the use of irrigation water for domestic purposes.
6. Official establishment of a systemwide initiative on malaria and agriculture.

Milestones 2002:

1. Guidelines for vector control in irrigated areas for use by irrigation managers and farmers completed.
2. Technical and institutional guidelines available for improving water supply and sanitation in irrigated areas.
3. Completed the predevelopment biodiversity assessment of the Uda Walawe irrigation project extension.

Milestones 2003:

1. Tested methodologies for an agro-ecosystem approach to human health in Sri Lanka.
2. Impacts of water-saving irrigation methods on human health documented.
3. Interactions between malaria and agricultural production systems are scientifically documented.

Milestones 2004:

1. Completed a comprehensive cost-benefit analysis of wastewater irrigation, including the environmental and health costs and benefits.
2. Completed a post-development biodiversity assessment of the Uda Walawe irrigation project extension area.
3. Methods and tools are available to maximize health opportunities in agriculture development and minimize or mitigate negative health impacts.

Gains

- Reduced negative health and environmental impacts of irrigated agriculture through alternative irrigation design and management.
- Improved assessment of the economic value of land, water and environmental resources.

Duration

Indefinite.

Costs (in million US dollars)

2001: 1.2; 2002: 1.5; 2003: 2.0; 2004: 2.5

Users

Government planners and agencies concerned with policies and practices for irrigation and the use of water resources; irrigation, health and environmental authorities; water user associations and related civil society organizations.

Collaborators

University of Peradeniya, Sri Lanka; Institute of Public Health, Lahore; McGill University Brace Center for Water Resources Management; Royal Veterinary and Agricultural University, Copenhagen; Department of International Health, University of Copenhagen; Mahaweli Authority, Sri Lanka; University of East Anglia; Center of Excellence in Water Resources,

Lahore; Faisalabad Agricultural University, Pakistan; Technical University Hamburg-Harburg; Vietnam Institute for Water Resources Management; National Institute of Hygiene and Epidemiology, Hanoi; DHI-Water & Environment, Denmark; Anti-Malaria Campaign, Sri Lanka; International Center for Insect Physiology and Ecology (ICIPE); WHO (Panel of Experts on Environmental Management and Vector Control-PEEM); University of Nairobi; Division of Vector-Borne Disease, Ministry of Health, Kenya; Kenya Medical Research Institute; National Irrigation Board, Kenya; IUCN Sri Lanka; London School of Hygiene and Tropical Medicine; MSF-HealthNet International, Peshawar; Department of Wildlife Conservation, Sri Lanka; University of Kelaniya, Sri Lanka; Center for Ecology and Hydrology (CEH), UK; Royal Tropical Institute, Amsterdam; CARE; Catholic Relief Service-CRS; Institut Agronomique et Vétérinaire Hassan II, Morocco; Ministry of Health, Morocco; University of Zimbabwe.

CGIAR Logframe Output Linkages

Output 3, sustainable production systems and natural resource conservation: 50%; Output 4, improved policy analyses and techniques: 30%; Output 5, enhancing performance of research and related institutions: 20%.

Financing Plan

Donors: Government of Japan; Government of Sri Lanka; Danida; BMZ; IDRC; CIDA; Council of Agriculture of Taiwan; Private irrigation associations of Taiwan.

Systemwide Initiative on Water Management (SWIM-2)

Comprehensive Assessment of Water Management in Agriculture: Benefits, Costs and Future Directions

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Inform the scientific community, general public and decision makers about key issues of using water for food production and their impacts on livelihoods and environmental security.

Purposes

Carry out a comprehensive analysis of the benefits and costs of irrigation development, and provide insights on the future direction of irrigated agriculture. The analysis will include impacts on production and prices, poverty, and environment. This includes global, regional and local- scale analyses using information tools developed by IWMI and partners. Specifically:

1. Develop and apply analytical methods and tools to assess the societal and ecosystem costs and benefits of water use.
2. Identify and evaluate important trade-offs between water for food security and the environmental conservation.
3. Provide feedback into a global dialogue that will strive to gain consensus among key stakeholders from the irrigation, environment and rural development communities on the role irrigated agriculture plays and should play in the future.

Outputs

1. A credible and authoritative assessment of past benefits and costs of irrigation as a means of managing water for agriculture.
2. Future directions for water management for agriculture explored, quantified, and described with results accessible to policy makers, and the general public:
 - At the global scale.
 - For selected nations and regions.
 - For selected important river basins representing a cross situation of the water management problems and opportunities faced today.
3. Definitions, indicators, concepts, and background material related to food and environmental security.
4. Case studies to document problems around food and environmental security, and how these were resolved, in order to provide synthesized information to those facing similar problems in similar environments.
5. A common framework for understanding water productivity, detailed strategies for increasing the productivity of water in agriculture, and a research agenda for future actions in increasing water productivity from considering water management to genetic material for crops.
6. Analytic tools for exploring options and trade-offs at the global, national and basin scale.

7. Significantly advanced datasets on

- The world's irrigated area, including spatial distribution, cropping intensity and water use.
- The contribution of groundwater to agriculture and the extent of exploitation of groundwater in a non-sustainable manner.

8. Contributions to the Global Dialogue on Food and Environmental Security to contribute to the discussion on future directions of using water for agriculture, and to gain major exposure for IWMI's research thus enhancing the impact of the institute's work.

Achievements in 2000

New MTP Project, draft design of the Global Dialogue on Food and Environmental Security.

Milestones

There will be ample opportunities through the dialogue process to present results and gain feedback. The 3rd World Water Forum to be held in Kyoto, Japan in March 2003 marks an important milestone in the process to present and discuss results.

2001: First dialogue and agreement with stakeholders on methodology and division of responsibility; SWIM 2 agreements formed.

2002: Assessment in progress with SWIM 2 and other partners taking part in research.

2003: Results presented at World Water Forum, irrigated areas of Asia mapped, interim analysis of past benefits and costs of water management for agriculture presented; significantly upgraded dataset on groundwater available; modeling of future directions.

2004: Basin and local case studies giving indications of future directions developed and discussed with partners.

Gains

- An authoritative and credible assessment of the benefits and costs of irrigation.
- Much improved data.
- Key inputs into the Global Dialogue on Food and Environmental Security.
- Future directions charted to assist investments and other decisions in managing water for agriculture.

Duration

The overall timeframe of the comprehensive assessment is five years, with the end point being the 4th World Water Forum in Montreal Canada, March 2006. Funding will be sought for individual components of the comprehensive assessment. The overall funding level is estimated at \$12.5 million over the five-year period.

Costs (in million US dollars)

2001: 1.5; 2002: 2.02; 2003: 2.3; 2004: 2.62

Users

Water users, water managers, planners, civil society organizations, global organizations and networks representing agriculture, rural development and environmental communities; development banks; governments; research and planning agencies concerned with policies and practices for irrigation and the use of water resources; environmental authorities.

Collaborators

CG Centers through SWIM 2.

Stockholm Environmental Institute (SEI); International Program for Technology Research in Irrigation and Drainage (IPTRID); Food and Agriculture Organization (FAO); Global Water Partnership (GWP); International Commission on Irrigation & Drainage (ICID); World Conservation Union (IUCN); United Nations Environmental Program (UNEP); World Health Organization (WHO); World Water Council (WWC); India's Central Water Commission, and planning agencies from other countries.

Chinese Council on Agriculture Policy; University of Colorado; Asian Institute of Technology; Participants of the 3rd World Water Forum including NGOs, private sector, water managers and other research institutes.

CGIAR Logframe Output Linkages

Output 3, sustainable production systems and natural resource conservation: 40%; Output 4, improved policy analyses and techniques: 40%; Output 5, enhancing performance of research and related institutions: 20%.

Financing Plan

SWIM finances will support MTP 6.

IWMI will seek support from a variety of donors to fund elements of this research, including the Governments of Switzerland, Canada, United Kingdom, USA, Germany, France, Japan, Netherlands, and Australia, Asian Development Bank, International Fund for Agricultural Development, African Development Bank and the World Bank, and others.

Systemwide Initiative on Malaria and Agriculture (SIMA)

Goal

Improved management of water and land resources for food, livelihoods and nature.

Intermediate Goal

Reduced incidence of malaria resulting in less human suffering and increased agricultural productivity.

Purpose

Interactions between agricultural production systems and malaria are scientifically documented and methods and tools are developed that make it possible to maximize health opportunities in agricultural development and minimize or mitigate negative health impacts.

Outputs

- State-of-the-art knowledge on the agriculture-malaria interactions is available at a central point and universally accessible.
- Impact of agricultural development on malaria transmission, morbidity and mortality is evaluated.
- Impact of malaria on agricultural productivity of poor farming communities is documented.

Achievements in 2000:

This is a new project that was initiated late in 2000 on the request of the Centers Directors Committee during ICW-2000.

Milestones 2001:

1. Electronic discussion with broad participation completed, synthesis report produced.
2. Stakeholder workshop held in Nairobi.
3. SIMA officially launched as a CGIAR systemwide initiative.
4. Donor commitment to funding SIMA obtained.

Milestones 2002:

1. At least four research projects are started under the auspices of SIMA, coordinated by different CGIAR centers.
2. Partnership/dialogue established between the health and agriculture sectors.
3. Authoritative state-of-the-art report produced on the malaria and agriculture linkages.

Milestones 2003:

1. Methodology developed for prospective health impact assessment of agricultural development projects.

Milestones 2004:

2. SIMA research projects lead to practical agriculture-based interventions that are successful in controlling malaria.

Gains

- Partnership between the agriculture and health sectors on agro-ecosystem management for human health.
- Reduced incidence of malaria with reduced human suffering and increased agricultural productivity.

Duration

8 years

Costs (in million US dollars)

To be determined.

2001: 0; 2002: 0; 2003: 0; 2004: 0

Users

Government planners and agencies form the agriculture and health sectors.

Collaborators

ICRAF, ICIPE, IDRC, IITA, IPGRI, ISNAR, WARDA, World Health Organization – Roll Back Malaria Program, Danish Bilharziasis Laboratory, University of Copenhagen, National Agricultural and Health Research Institutes.

CGIAR Logframe Output Linkages

Output 3, sustainable production systems and natural resources conservation: 50%; Output 4, improved policy analyses and techniques: 30%; Output 5, enhancing performance of research and related institutions: 20%.

Financing Plan

USAID, IDRC, private foundations.

Financial Overview 2000-2005

(Year 2001 constant dollars, in '000s)

	2000	2001	2002	2003	2004	2005
Researchers (total cost)						
Principal Researchers	1,666	2,550	2,850	3,300	3,450	3,450
Senior Researchers	620	1,000	1,400	1,500	1,600	1,700
Researchers	350	420	630	910	1,050	1,190
Post Doctoral Fellows	60	520	640	640	640	640
Regionally Recruited Researchers		125	380	575	690	805
Nationally Recruited Research Associates	264	240	300	300	300	300
	2,960	4,855	6,200	7,225	7,730	8,085
Fellows	150	225	255	300	300	300
Consultants	939	400	400	400	400	400
Outsourced Resources (NARS, etc.)	323	1,400	1,800	2,000	2,000	2,400
Direct Research Personnel Costs	4,372	6,880	8,655	9,925	10,430	11,185
Research Support						
Headquarters and Regional Offices	2,163	2,785	2,980	3,095	3,305	3,430
Headquarters						
Management and Administrative expenses including depreciation	2,261	2,500	2,590	2,690	2,790	2,790
Total	8,796	12,165	14,225	15,710	16,525	17,405

Staff Overview 2000-2005

Researchers	2000	2001	2002	2003	2004	2005
Internationally Recruited						
<i>Principal Researchers</i>	14	17	19	22	23	23
<i>Senior Researchers</i>	6	10	14	15	16	17
<i>Researchers</i>	5	6	9	13	15	17
<i>Post Doctoral Fellows</i>	4	17	20	20	20	20
	29	50	62	70	74	77
Regionally Recruited Researchers	–	3	10	15	18	21
Nationally Recruited Research Associates	17	20	25	25	25	25
Total Researchers excluding Fellows	46	73	97	110	117	123



FUTURE
HARVEST
IWMI is a Future Harvest Center
Supported by the CGIAR

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